

U.S. Patent Application Serial No. 10/527,090
Amendment filed November 2, 2006
Reply to OA dated August 14, 2006

AMENDMENTS TO THE CLAIMS:

Please cancel claims 4, 10 and 22 without prejudice or disclaimer, and amend claims 1, 7, 11, 13, 19, 23, 25-26, 28-29, 31-33 and 34-35. This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended): A transformant of *Streptomyces mobaraensis*, comprising a structural gene of transglutaminase isolated from *Streptomyces mobaraensis* and a promoter and a terminator acting on the structural gene, which are externally introduced,
wherein the structural gene comprises the sequence set forth in SEQ ID NO: 1.

Claim 2 (Previously Presented): The transformant of *Streptomyces mobaraensis* according to claim 1, wherein the promoter is a promoter of transglutaminase isolated from *Streptomyces mobaraensis*.

Claim 3 (Previously Presented): The transformant of *Streptomyces mobaraensis* according to claim 1, wherein the terminator is a terminator of transglutaminase isolated from *Streptomyces mobaraensis*.

Claim 4 (Canceled):

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Claim 5 (Previously Presented): A transformant of *Streptomyces mobaraensis* comprising a DNA fragment having an externally introduced sequence set forth in SEQ ID NO: 2.

Claim 6 (Previously Presented): The transformant of *Streptomyces mobaraensis* according to claim 1, which is a transformant of *Streptomyces mobaraensis* S-8112.

Claim 7 (Currently Amended): A process for producing transglutaminase, comprising the steps of:

culturing a transformant of *Streptomyces mobaraensis* comprising a structural gene of transglutaminase isolated from *Streptomyces mobaraensis* and a promoter and a terminator acting on the structural gene, which are externally introduced, under the conditions where the structural gene can be expressed; and

collecting the produced transglutaminase,

wherein the structural gene comprises the sequence set forth in SEQ ID NO: 1.

Claim 8 (Previously Presented): The process for producing transglutaminase according to claim 7, wherein the promoter is a promoter of transglutaminase isolated from *Streptomyces mobaraensis*.

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Claim 9 (Previously Presented): The process for producing transglutaminase according to claim 7, wherein the terminator is a terminator of transglutaminase isolated from *Streptomyces mobaraensis*.

Claim 10 (Canceled).

Claim 11 (Currently Amended): The process for producing transglutaminase ~~according to claim 7~~, comprising the steps of:

culturing a transformant of *Streptomyces mobaraensis* comprising a structural gene of transglutaminase isolated from *Streptomyces mobaraensis* and a promoter and a terminator acting on the structural gene, which are externally introduced, under the conditions where the structural gene can be expressed; and

collecting the produced transglutaminase,

wherein the transformant of *Streptomyces mobaraensis* comprises a DNA fragment having an externally introduced sequence set forth in SEQ ID NO: 2.

Claim 12 (Previously Presented): The process for producing transglutaminase according to claim 7, wherein the transformant of *Streptomyces mobaraensis* is a transformant of *Streptomyces mobaraensis* S-8112.

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Claim 13 (Currently Amended): A transformant of *Streptomyces lividans* comprising a structural gene of transglutaminase isolated from *Streptomyces mobaraensis*, and a promoter and a terminator acting on the structural gene, which are externally introduced, wherein the structural gene comprises the sequence set forth in SEQ ID NO: 1.

Claim 14 (Previously Presented): The transformant of *Streptomyces lividans* according to claim 13, wherein the promoter is a promoter of transglutaminase isolated from *Streptomyces mobaraensis*.

Claim 15 (Previously Presented): The transformant of *Streptomyces lividans* according to claim 13, wherein the terminator is a terminator of transglutaminase isolated from *Streptomyces mobaraensis*.

Claim 16 (Previously Presented): The transformant of *Streptomyces lividans* comprising a structural gene of transglutaminase and a promoter and a terminator acting on the structural gene, which are externally introduced, wherein the structural gene comprises a sequence set forth in SEQ ID NO: 1.

Claim 17 (Previously Presented): A transformant of *Streptomyces lividans* comprising a DNA fragment having an externally introduced sequence set forth in SEQ ID NO: 2.

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Claim 18 (Previously Presented): The transformant of *Streptomyces lividans* according to claim 13, which is a transformant of *Streptomyces lividans* 3131.

Claim 19 (Currently Amended): A process for producing transglutaminase, comprising the steps of:

culturing a transformant of *Streptomyces lividans* comprising a structural gene of transglutaminase isolated from *Streptomyces mobaraensis*, and a promoter and a terminator acting on the structural gene, which are externally introduced, under the conditions where the structural gene can be expressed; and

collecting the produced transglutaminase, wherein the structural gene comprises the sequence set forth in SEQ ID NO: 1.

Claim 20 (Previously Presented): The process for producing transglutaminase according to claim 19, wherein the promoter is a promoter of transglutaminase isolated from *Streptomyces mobaraensis*.

Claim 21 (Previously Presented): The process for producing transglutaminase according to claim 19, wherein the terminator is a terminator of transglutaminase isolated from *Streptomyces mobaraensis*.

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Claim 22 (Canceled).

Claim 23 (Currently amended): The process for producing transglutaminase ~~according to claim 19~~ comprising the steps of:

culturing a transformant of *Streptomyces lividans* comprising a structural gene of transglutaminase isolated from *Streptomyces mobaraensis*, and a promoter and a terminator acting on the structural gene, which are externally introduced, under the conditions where the structural gene can be expressed; and

collecting the produced transglutaminase,

wherein the transformant of *Streptomyces lividans* comprises a DNA fragment having an externally introduced sequence set forth in SEQ ID NO: 2.

Claim 24 (Previously Presented): The process for producing transglutaminase according to claim 19, wherein the transformant of *Streptomyces lividans* is a transformant of *Streptomyces lividans* 3131.

Claim 25 (Currently Amended): A transformant of *Streptomyces mobaraensis* comprising a structural gene of transglutaminase and a promoter and a terminator acting on the structural gene, which are externally introduced,

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wherein the structural gene comprises a sequence obtained by modifying SEQ ID NO: 1, such that the modified sequence hybridizes to DNA of SEQ ID NO: 1 under conditions of 50% ~~formaldehyde~~ formamide, 10 × SSC, 5 × Denhardt solution, 1%SDS, 10% dextran sulfate, 10 µg/ml denatured salmon sperm DNA and 50 mM phosphoric acid buffer (pH 7.5) at 42°C, followed by washing with 0.1 × SSC and 0.1%SDS at 68°C, and the modified sequence encodes a protein having transglutaminase activity.

Claim 26 (Currently Amended): A transformant of *Streptomyces mobaraensis* comprising a structural gene of transglutaminase and a promoter and a terminator acting on the structural gene, which are externally introduced,

wherein the structural gene of transglutaminase and the promoter and the terminator acting on the structural gene comprise a sequence obtained by modifying SEQ ID NO: 2, such that the modified sequence hybridizes to DNA of SEQ ID NO: 2 under conditions of 50% ~~formaldehyde~~ formamide, 10 × SSC, 5 × Denhardt solution, 1%SDS, 10% dextran sulfate, 10 µg/ml denatured salmon sperm DNA and 50 mM phosphoric acid buffer (pH 7.5) at 42°C, followed by washing with 0.1 × SSC and 0.1% SDS at 68°C, and the modified sequence encodes a protein having transglutaminase activity.

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Claim 27 (Previously Presented): The transformant of *Streptomyces mobaraensis* according to claim 1, which is a transformant of a strain obtained by mutating *Streptomyces mobaraensis* S-8112.

Claim 28 (Currently Amended): A process for producing transglutaminase, comprising the steps of:

culturing a transformant of *Streptomyces mobaraensis* comprising a structural gene of transglutaminase and a promoter and a terminator acting on the structural gene, which are externally introduced, under the conditions where the structural gene can be expressed; and

collecting the produced transglutaminase;

wherein the structural gene comprises a sequence obtained by modifying SEQ ID NO: 1, such that the modified sequence hybridizes to DNA of SEQ ID NO: 1 under conditions of 50% ~~formaldehyde~~ formamide, 10 × SSC, 5 × Denhardt solution, 1% SDS, 10% dextran sulfate, 10 µg/ml denatured salmon sperm DNA and 50 mM phosphoric acid buffer (pH 7.5) at 42°C, followed by washing with 0.1 × SSC and 0.1% SDS at 68°C, and the modified sequence encodes a protein having transglutaminase activity.

Claim 29 (Currently Amended): A process for producing transglutaminase, comprising the steps of:

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culturing a transformant of *Streptomyces mobaraensis* comprising a structural gene of transglutaminase and a promoter and a terminator acting on the structural gene, which are externally introduced, under the conditions where the structural gene can be expressed; and

collecting the produced transglutaminase;

wherein the structural gene of transglutaminase and the promoter and the terminator acting on the structural gene comprise a sequence obtained by modifying SEQ ID NO: 2, such that the modified sequence hybridizes to DNA of SEQ ID NO: 2 under conditions of 50% ~~formaldehyde~~ formamide, 10 × SSC, 5 × Denhardt solution, 1% SDS, 10% dextran sulfate, 10 µg/ml denatured salmon sperm DNA and 50 mM phosphoric acid buffer (pH 7.5) at 42°C, followed by washing with 0.1 × SSC and 0.1% SDS at 68°C, and the modified sequence encodes a protein having transglutaminase activity.

Claim 30 (Previously Presented): The process for producing transglutaminase according to claim 7, wherein the transformant of *Streptomyces mobaraensis* is a transformant of a strain obtained by mutating *Streptomyces mobaraensis* S-8112.

Claim 31 (Currently Amended): A transformant of *Streptomyces lividans* comprising a structural gene of transglutaminase and a promoter and a terminator acting on the structural gene, which are externally introduced,

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wherein the structural gene comprises a sequence obtained by modifying SEQ ID NO: 1, such that the modified sequence hybridizes to DNA of SEQ ID NO: 1 under conditions of 50% ~~formaldehyde~~ formamide, 10 × SSC, 5 × Denhardt solution, 1% SDS, 10% dextran sulfate, 10 µg/ml denatured salmon sperm DNA and 50 mM phosphoric acid buffer (pH 7.5) at 42°C, followed by washing with 0.1 × SSC and 0.1% SDS at 68°C, and the modified sequence encodes a protein having transglutaminase activity.

Claim 32 (Currently Amended): A transformant of *Streptomyces lividans* comprising a structural gene of transglutaminase and a promoter and a terminator acting on the structural gene, which are externally introduced,

wherein the structural gene of transglutaminase and the promoter and the terminator acting on the structural gene comprise a sequence obtained by modifying SEQ ID NO: 2, such that the modified sequence hybridizes to DNA of SEQ ID NO: 2 under conditions of 50% ~~formaldehyde~~ formamide, 10 × SSC, 5 × Denhardt solution, 1% SDS, 10% dextran sulfate, 10 µg/ml denatured salmon sperm DNA and 50 mM phosphoric acid buffer (pH 7.5) at 42°C, followed by washing with 0.1 × SSC and 0.1% SDS at 68°C, and the modified sequence encodes a protein having transglutaminase activity.

Claim 33 (Previously Presented): The transformant of *Streptomyces lividans* according to claim 13, which is a transformant of a strain obtained by mutating *Streptomyces lividans* 3131.

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Claim 34 (Currently Amended): A process for producing transglutaminase, comprising the steps of:

culturing a transformant of *Streptomyces lividans* comprising a structural gene of transglutaminase and a promoter and a terminator acting on the structural gene, which are externally introduced, under the conditions where the structural gene can be expressed; and

collecting the produced transglutaminase;

wherein the structural gene comprises a sequence obtained by modifying SEQ ID NO: 1, such that the modified sequence hybridizes to DNA of SEQ ID NO: 1 under conditions of 50% ~~formaldehyde~~ formamide, 10 × SSC, 5 × Denhardt solution, 1% SDS, 10% dextran sulfate, 10 µg/ml denatured salmon sperm DNA and 50 mM phosphoric acid buffer (pH 7.5) at 42°C, followed by washing with 0.1 × SSC and 0.1% SDS at 68°C, and the modified sequence encodes a protein having transglutaminase activity.

Claim 35 (Currently Amended): A process for producing transglutaminase, comprising the steps of:

culturing a transformant of *Streptomyces lividans* comprising a structural gene of transglutaminase and a promoter and a terminator acting on the structural gene, which are externally introduced, under the conditions where the structural gene can be expressed; and

collecting the produced transglutaminase;

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wherein the structural gene of transglutaminase and the promoter and the terminator acting on the structural gene comprise a sequence obtained by modifying SEQ ID NO: 2, such that the modified sequence hybridizes to DNA of SEQ ID NO: 2 under conditions of 50% ~~formaldehyde~~ formamide, 10 × SSC, 5 × Denhardt solution, 1% SDS, 10% dextran sulfate, 10 µg/ml denatured salmon sperm DNA and 50 mM phosphoric acid buffer (pH 7.5) at 42°C, followed by washing with 0.1 × SSC and 0.1% SDS at 68°C, and the modified sequence encodes a protein having transglutaminase activity.

Claim 36 (Previously Presented): The process for producing transglutaminase according to claim 19, wherein the transformant of *Streptomyces lividans* is a transformant of a strain obtained by mutating *Streptomyces lividans* 3131.